

**Issue 9
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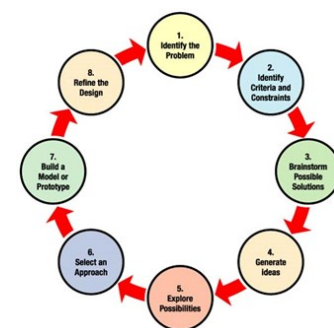
What is STEM?

By: Paul Keidel, ND STEM Network Chair

The definition of STEAM has been debated in various sectors nationally and locally. Featured in the next several issues of the STEAM newsletter will be STEM and STEAM experts from North Dakota who will share their thoughts on STEAM education. This month we feature Paul Keidel. Paul is currently president of the ND STEM Network, is an educator in the Bismarck Public Schools system, and also works for Missouri River Education Cooperative.

It is with great pleasure that I write this article for the ND STEM community. The ND STEM Network members are asked quite often what the ND STEM Network is. It is a partnership of change-making individuals from K-12 education, higher education, North Dakota state government, industry, economic development and non-profit organizations who believe that outstanding STEM education is the key to North Dakota's future in order to prepare our children and maintain a strong economy. It also has partnerships with national organizations focused on education and workforce issues. This statewide network is comprised of four regional communities, defined geographically as Northeast, Northwest, Southeast, Southwest, and North Dakota's Native American communities.

There are many ways to define STEM education. Most STEM definitions come from the local or regional environment that has been created to engage students. In the ND STEM Network, STEM education is defined as an effort to increase the number of students going into STEM career fields and, therefore, creating more engineers or scientists. However, STEM education goes beyond that. It is a paradigm shift, a completely new philosophy for teaching and learning; one that allows students to engage in dynamic learning communities focusing on projects and using the engineering design process. The engineering design process integrates several subjects making each subject more relevant to the working world. This type of learning allows students to be more creative and innovative, to work as teams, to communicate, and to problem solve. This learning process more closely replicates what happens in the 21st century workplace.



STEM education gives students an opportunity to build 21st century skills like creativity, critical thinking, strategic thinking, collaboration, and communication. STEM education gets students engaged and actively involved in the learning process. STEM education excites and inspires kids by employing their newfound knowledge in authentic experiences that are awe-inspiring and cemented into their memory.

What is STEM? (continued)

STEM is the tie that binds our current curriculum. It focuses on the same North Dakota standards by using the engineering design process as a method for problem solving and seeing the overlap in our curriculum.

The engineering design process is a method for solving problems in a way that results in the optimal outcome. It teaches students that real-world problems can have multiple solutions and, therefore, it is important to think about how we can choose the best possible solution. The engineering design process uses an organized system of thinking. It also teaches students that problem solving is an interactive process with many cycles of thought. This type of process improves a student's ability to solve problems in any discipline.

STEM education is a necessity and not a luxury. STEM education is vital for our national security and global competitiveness. Corporations and multinational companies have made the paradigm shift to the 21st century. Education, except in pockets, has not turned the corner to make the shift. Corporations are increasing their recruitment of innovators and technological experts from other countries because our education system is not providing them with the workforce they need. The majority of the U.S. workers in the future will need to have some education past high school and in many cases the students will need to continue the learning process throughout their lives.

Math Stations in Action!



The amount of information in the world is increasing exponentially. We need to produce people who are proficient at navigating these large volumes of information and capable of producing the next innovations. Increasingly those innovations will occur between disciplines and focus on interdisciplinary and transdisciplinary problem solving.

Technology complements workers with higher education and higher skill levels, displacing workers who perform routine tasks. It will be critical for educators to produce technologically literate people who can use technology as a tool and can quickly learn and adapt new interfaces to solve problems.

If we were to stick with our old education system, we would not be able to provide our students with an opportunity for deep and enriching experiences in curriculum. Traditional education lacks the ability to broadly excite inquiring minds or invite success by giving students a chance to practice 21st century skills which include communication, teamwork, creativity and innovation. High Tech High, a STEM high school located in California, describes the three axioms of public education as it currently exists:

- We separate head from body
- We separate children by ability
- We separate school from the real world

A question that is often asked is, "What does a STEM classroom look like?" STEM classrooms look like cooperative problem-solving stations. Here are some ideas that describe a STEM classroom: tools, experiments, labs, tinkering, technology rich, outside resources, enriching curriculum, building, experiencing, empathy, student voice, student participation, student engagement, teacher teaming, teacher internships, staff collaboration, differentiation, learning for all.

Currently, incubator STEM platform schools are out performing their district schools in math and science. Graduation rates have also increased.

What is STEM? (continued)

The mission of the ND STEM Network aims to connect and increase collaboration across the state in order to provide greater opportunities in regard to STEM education and workforce development. The ND STEM Network will strengthen the education system in North Dakota, while further aligning education with economic development and workforce needs, providing skills and opportunities for all students to be globally competitive.

The ND STEM Network goals plan to change the face of education. The statewide effort will connect education to industry in order to create environments in which students can develop skills to prepare them for the 21st century workplace. It will eliminate demographic and geographical barriers; STEM education will make education accessible and relevant to all students.

A STEM Network is important to North Dakota because it shows value. The North Dakota Department of Commerce affirms that the state's business climate has gained a reputation for supporting emerging businesses, entrepreneurs, and expansions, stating, "The state's growing manufacturing, technology-based businesses, agriculture and energy industries are drawing some of the world's most recognized companies into the state." These industries all demand well-prepared employees with the problem solving and analytical



skills that are developed and refined through STEM education. The North Dakota University System's strategic plan recognizes the importance of STEM education with a special focus on agriculture, energy, life sciences, health care, and advanced technology.



If the people of North Dakota can create an environment that allows students to access more and higher levels of mathematics and science along with other subjects, we will create a pipeline of talent that can respond to future workforce needs. They will become globally

competitive, entrepreneurial, competent graduates who are college and work ready. When they stay in North Dakota, they will create a pipeline of talent that will attract more investments and new businesses and jobs, therefore, strengthening and evolving the state's economy. Everyone in North Dakota is a stakeholder in the development of STEM education.

Since November of 2010, a group of like-minded individuals from K-12 education, higher education, state government, industry, economic development, and non-profit organizations continue to collaborate and design a network. These STEM champions believe outstanding STEM education is the key to our children's and the state's future. This effort is a collaboration of community members throughout the state who support increased excellence in STEM education for ALL North Dakota students. The list of supporters is long and keeps growing.



Join the ND STEM Network!

1st Annual ND Afterschool Summit

By: Becky Mueller, ND Afterschool Partnership

Over 100 attendees from across the state participated in the 1st Annual ND Afterschool Summit held on February 23, 2016 at the North Dakota Capitol in Bismarck, North Dakota.

The day started with a welcome from First Lady Betsy Dalrymple expressing her surprise that North Dakota is only one of two states that currently does not have an afterschool network as North Dakota is so progressive in so many areas. Betsy shared the importance of all children having opportunities, as they are the future.

State Superintendent Kirsten Baesler shared the public education system includes out-of-school and summer learning. There are currently 20,000 students participating in afterschool care, and an additional 26,000 students that would participate if it were available to them. Superintendent Baesler concluded, stating, “We need an afterschool network to tie it all together. It will add breadth and depth to information needed, provide quality training, and make afterschool better.”



Dr. Terry Peterson, keynote speaker, expressed afterschool and summer learning can expand student success and workforce readiness. There is increasing evidence that some students will need not only an improving school day, but also more afterschool and summer opportunities. High-quality, afterschool programs are proven to accelerate student achievement and development.

Cultivate 21 CEO and educator Molly Bestge shared the road to STEM, including STEM best practice and the engineering design process. She also shared how 21st century skills and the four C's (critical thinking, communication, collaboration, creativity) are needed for success.

Sam Wheeldon, John Deere Business Solutions, talked about inspiring the next generation of innovators, stating, “John Deere cares about STEM and has incorporated John Deere Inspires and Project Lead the Way in communities where John Deere businesses reside.”

The MN Network's Brandon Tice, Ignite Afterschool, spoke to the evolution of a network. Brandon says, “The work of afterschool networks has long-term impacts, and young people's ability to access high-quality, afterschool programs is essential for every youth and every community to thrive.”



Youth of the past and present shared their testimony about their experiences in afterschool. The testimonies put it all in perspective as to why North Dakota needs an afterschool network. This initiative is all about helping the children of North Dakota reach their full potential.

The day concluded with break-out sessions where the participants discussed the next steps for the North Dakota Afterschool Partnership which evolves into an afterschool network.

Visit the [ND Afterschool Partnership](#) for more information or contact [Becky Mueller](#).

2016 Bison BEST Robotics Competition

Looking for a few more teams!



The dates have changed for this year; they have moved up a week. To better plan for this year, please sign up at [2016 Bison BEST Robotics](#).

This year's [2016 BEST Game Teaser](#).

A resource you all might find helpful is the [Friends of BEST in Alabama](#). It already has eight weeks of lessons dealing with this year's theme!!!



2016 Math and Science Partnership National Conference

By: Sarah Sletten, Mayville State University

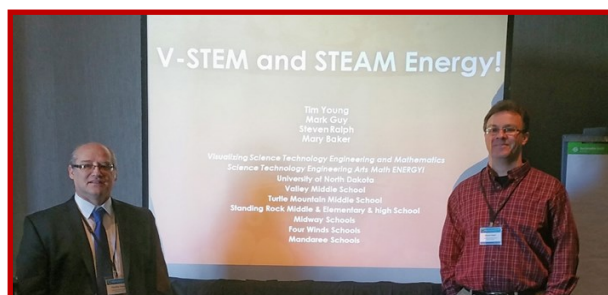
The 2016 U.S. Department of Education's Mathematics and Science Partnerships (MSP) conference was a bittersweet event for the MSP community. State leaders and program administrators met for the last time under the MSP banner; the program was not authorized in the newly signed Every Student Succeeds Act (ESSA). The conference's general theme centered on how states can move forward with MSP programs while transitioning into the new legislation.

Four project coordinators from two MSP projects represented North Dakota at the conference. Dr. Tim Young and Dr. Steven Ralph from the University of North Dakota and Molly Bestge and Dr. Sarah Sletten from Mayville State University.

The conference was held over two days in Baltimore, Maryland, and focused on aspects of successful programing and understanding where STEM-focused language can be found in the ESSA. It included large group plenaries, discussion panels, and breakout sessions. Areas of concentration included successful professional development interventions, implementing college and career ready standards, program evaluation, sustainability, and interdisciplinary STEM education. Drs. Young and Ralph presented their project—*V-STEM and STEAM Energy*—in a breakout session devoted to programs implementing engineering design activities. A poster session featured programs from across the country covering topics such as technology use, professional learning communities, teacher leaders, rigorous science standards, and inquiry-based instruction.



L to R: Sarah Sletten, Molly Bestge, Tim Young, and Steven Ralph



L to R: Tim Young and Steven Ralph presenting their breakout session.

With an emphasis on sustainability, many concerns were brought forward about the future of current MSP programming. It was evident from the programs showcased and the discussions among attendees that work being done "is good" and needs to continue. A message stated repeatedly throughout the conference was that although we know some of the title programs authorized in the ESSA supports STEM-focused activities, what those programs will

ultimately look like are not clear at this point. One certainty is that North Dakota will continue to seek out funding to support science and mathematics education.

NDSU, College of Engineering Offers High School STEM Summer Camps

High School STEM Camps for 2016

Grades 9-12

Fargo, North Dakota - July 11-14, 2016 (Check-in July 10/check-out July 14)

Game Design Camp

During this four-day residence camp at NDSU, participants will be introduced to game design principles which include the design elements of a good game, storyline, role playing, programming techniques, and game music making. Throughout the week, the game design development process will be emphasized as strategy games are created, tested, and demonstrated. Students will also work with technologies that include Scratch, GameMaker, the Unity Game Engine, and the Python Programming Language. Visit [STEM High School Boot Camp-Game Design](#) to register. (12 seats available)

VEX Robotics Boot Camp

This camp challenges students to discover the world of automation and robotics. During this four-day camp, students will learn how to use the VEX robotics and ROBOTC control systems. Then, they will be divided into teams and presented with an exciting design challenge in the form of a game. The teams will face-off in a competition to see whose design performs best! The challenge will only be possible utilizing teamwork, problem solving, and creativity. Visit [STEM High School Boot Camp-VEX Robotics](#) to register.

Shaping a Sustainable Clean Energy Future

Students will understand the challenges of conventional energy sources, and learn how to utilize alternative, renewable energy sources like wind and solar, which are essentially carbon free. This camp will include hands-on activities that will develop engineering skills and teach students how free sunlight can solve our daily energy needs. Students will also build and refine an energy transformation device that works within given constraints to convert sunlight to electrical energy. To build a successful device, they will apply science concepts they have learned and also tinker, craft, and experiment. They will use simple tools to design, test, and evaluate processes. Successfully making your own Dye Solar Cells will be a memorable experience! Visit [STEM High School Boot Camp-Shaping a Sustainable Clean Energy Future](#) to register.

New Dimension of Engineering Design: Nature's Way

The goal of this project is to help students incorporate imagination into their design process. The current product design approach is constraint by manufacturability and this limits innovation in us. Recent advancements in 3D printing technology provide a strategic advantage of design freedom that allows the construction of literally any shape. In this project, students will become familiar with the new era of design expectations through the use of 3D scanners and 3D printers. The students will learn how to design an object like nature does. This project will encourage students to strengthen their technology competence as well as innovative thinking. Visit [STEM High School Boot Camp-New Dimension of Engineering Design: Nature's Way](#) to register.

Materials Science

Materials science is a relatively new and broad field. It uses the principles of chemistry, physics, biology, and math to create innovative "new stuff". The new stuff is rapidly transforming in the way that everything from cars to light bulbs are made. It is helping to develop new, high-performing substances such as exotic alloys and super strong and super light composites, "smart" materials that can remember their shape, repair themselves, or assemble themselves into components. Emerging materials include composites, biomaterials, nanomaterials, graphite materials, prosthetics, and implants. This program will help you to understand different kind of material properties (stuff) through characterizing, designing, and testing. Visit [STEM High School Boot Camp-Materials Science](#) to register. (12 seats available)

National Youth Science Camp

By: Glenda Fauske, ND NYSC Coordinator

The National Youth Science Camp (NYSC), founded in 1963 by the State of West Virginia as part of its Centennial Celebration, was supported by the State for twenty years without private funding. In 1983, alumni and interested West Virginians who believed in the ideals of the NYSC established the nonprofit National Youth Science Foundation, Inc. to plan, raise financial support for, and oversee the continued operation of the National Youth Science Camp. Visit the [National Youth Science Foundation](#) for more information.

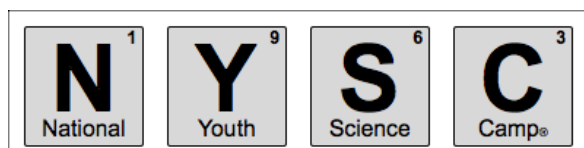


Today, the NYSC is a four-week-long, science education program that continues to honor and challenge two graduating high school science students from each state. Scientists from across the nation present lectures and hands-on science seminars and linger to interact informally with student delegates. Delegates are challenged to explore new areas in the biological and physical sciences, art, and music with resident staff members. Opportunities are provided for delegates to present seminars covering their own areas of interest and research. A visit to Washington D.C. permits delegates to visit some of the nation's premier scientific, governmental, and cultural facilities. The NYSC experience includes overnight excursions into the Monongahela National Forest featuring backpacking, rock-climbing, caving, mountain biking, and kayaking opportunities. Delegates are required to participate in the camp program for its entirety as the fast-paced activities and remote location make travel to and from the NYSC very difficult.

The NYSC experience is offered at no cost to its participants, so that selected delegates may attend regardless of their financial status. Contributions to the National Youth Science Foundation® allow delegates to participate in this "once in a lifetime" experience. Educational and recreational programming, as well as meals, lodging, and round-trip air passage on scheduled airlines are provided free of charge.

Delegates arrive in Charleston, West Virginia, on Wednesday, June 15, 2016, and depart on Sunday, July 10, 2016. The NYSC is held near Bartow in the eastern mountains of West Virginia, within the Monongahela National Forest.

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The National Youth Science Camp is an American organization located in Pocahontas County, West Virginia. It is a science education camp for individuals to attend after graduating high school. The camp only allows two students from each state in America to participate, as well as many pupils from other countries. Application forms are available and must be completed online at the [National Youth Science Camps](#) website. This year, applications were due before March 16.

The governor's office has requested the Coalition for Conservation and Environmental Education (C2E2) to coordinate the selection process for the two scholarships from 2015-2016. C2E2 is a nonprofit of organizations and individuals fostering environmental literacy in North Dakota since 1995. C2E2 maintains decisions regarding natural resources be based on scientific fact.

For more information, visit the [Coalition for Conservation and Environmental Education](#) website.

National Youth Science Camp History (continued)

Governor Jack Dalrymple seeks two high school seniors to receive a full scholarship to exchange ideas with scientists and other professionals from the academic and corporate worlds. The nearly month-long experience includes lectures and hands-on research projects presented by scientists from across the nation; overnight camping trips into the Monogahela National Forest; and a visit to Washington D.C. The selected delegates must not only demonstrate academic achievement in science, but also show potential for thoughtful scientific leadership. Student applicants from North Dakota are Darian Colgrove, Tai Mosley, Kaydin Schmitt, Caleb Southerland, and Whitney Welder.

Winners were Darian Colgrove and Tai Mosley. ***Congratulations!***



Darian Colgrove ***WINNER***

Darian Colgrove is a senior at Grand Forks Central High School. He has always been interested in the sciences and plans to attend college majoring in astrophysics. Darian was involved in the InSPIRESS where he was involved in an engineering competition focused on designing a payload to go to Titan. He has also been involved in various extracurricular activities, including cross country and track where he has served as captain. He has also been involved in debate, math track, and science bowl. He is also a National Honor Society member and is on the Grand Forks Youth Commission.



Tai Mosley ***WINNER!***

Tai Mosley is a senior at Red River High School in Grand Forks. At a very early age, Tai determined her goal was to practice medicine. Tai was selected to attend North Dakota Governor's School where her research project was Nuclear-Targeted, Redox-Sensitive Polymersomes: New Smart Drug Delivery Vehicles. Tai has been involved in student council, acted as a freshman mentor, and participated in various mission trips. Tai has also worked at Altru Health Systems as a way of furthering her experience in order to practice medicine.

National Youth Science Camp History (continued)

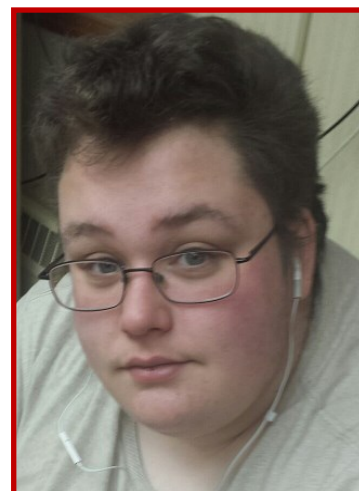


Kaydin Schmitt

Kaydin is a senior at Hazen High School in Hazen, North Dakota. Kaydin's goal is to double major in biology and chemistry with an emphasis in criminalistics and minor in psychology with the goal of working for an FBI Response Team. Besides her interest in science, Kaydin is involved in various extracurricular activities. Kaydin has been involved in Coal Country Leadership Academy, she is a national honor society member, she is involved in Future Business Leaders of America and is active in hockey. Kaydin has been one of the captains of her hockey team for two years. She has also assisted younger skaters with learning the fundamentals of hockey through the Hazen Winter Sports Association.

Caleb Southerland

Caleb Southerland is a senior at Mott/Regent High School. Caleb is interested in pursuing engineering in the future. He is involved in the Quiz Bowl and chess club. Caleb also is very involved in German club and has won several awards in this area. He has been involved in science fairs and placed in the physics category. He plays trumpet and is an avid table-top gamer. He volunteers with numerous organizations such as Operation Christmas Child Shoeboxes and Samaritans' Purse Organizations.



Whitney Welder

Whitney Welder is a senior at Wahpeton Senior High in Wahpeton. She has always been strong academically; however, her interest in science strengthened when she was involved in a near drowning incident as a lifeguard. This experience solidified her interest in the science and has directed her interest towards medical school. Besides having a strong academics background, Whitney is involved in numerous extracurricular activities and work. She is involved in cross country, track, speech, concert band, swing choir, and student council among other activities. She is a water safety instructor and lifeguard at the North Dakota State College of Science swimming pool.

Langdon Area High School Holds STEAM Academy

By: Melissa Hiltner, Langdon Area Schools Instructional Strategist

On March 17, 2016, Langdon Area High School did something that has never been done there before ~ they held a STEAM Academy for their 7-12 grade students. “We have a strong art program, as well as strong science and math programs. It was our hope that we could integrate these together into a hands-on, FUN, STEAM Academy for our students,” stated Melissa Hiltner, Instructional Coach for Langdon Area Schools. The STEAM Academy was designed to bring in both the creative process and the scientific method to demonstrate to the students how these disciplines work together in our 21st century workforce – and in life.

The students were grouped into multi-age teams to work on STEAM projects. Integration of technology also played a role in the success of the STEAM Academy. Students used the newest, latest iPads, purchased just recently by the Langdon Area School Foundation Board, to research, compare, and support their findings as they problem solved with the Engineering Design Process.



The STEAM Committee for Langdon Area Schools (which consists of Melissa Hiltner; Mindi Lill, Art Instructor; and Mark Mindt, Superintendent) also assembled a group of community members to attend the STEAM Academy as “guest consultants.” “For example, one group was learning about the physics of a chair and then designing it out of cardboard, so we invited the owners of the local furniture store to come support and give advice to the groups.” Lill said.

Perspective 3D Challenge

Another creative component of the STEAM Academy was our local community was invited to view the completed projects after school. The other local schools and our elementary students were invited to visit the next day to observe and discuss the finished projects.

The STEAM Academy was not just a “fun day!” The STEAM Committee made sure there was accountability for learning. Each STEAM project was aligned to the North Dakota State Standards in all areas of STEAM (science, technology, engineering, arts, and math). Mark Mindt, Superintendent, wanted to make sure we could prove to our stakeholders this was a viable, educational activity that will help our students learn and thrive to become stronger problem-solvers, innovators, and logical thinkers. The students were also evaluated on the “four C’s” ~ **communication, collaboration, creativity, and critical thinking** ~ through a rubric completed by a staff member of each team.



We also wanted to give examples of successful STEAM innovators our students would know and be able to connect with in the real world. We displayed famous STEAM thinkers like Steve Jobs, founder of APPLE; Marissa Mayer, Chief Executive Office of Yahoo!; and Dong-Hoon Chang, Executive Vice President of Samsung, along with the STEAM qualities they have exhibited for their success. STEAM collaboration is the wave of the future. We made sure our students knew, “The future is yours – YOU MATTER – and when you think critically and work together, anything is possible!”

“After this activity is complete,” Mindt reflected, “we’ll gather our STEAM team together and assess if this is something we’d like to continue for our schools.”

- ⇒ *“It was a new and exciting activity. Working with new people was both fun and challenging. I hope we get to do it again! ...hope it's not too late in the school year.” - freshman at Langdon Area High School*
- ⇒ *“My favorite part was making the cardboard chair. I got to use the hot glue gun. It was a nice change from the regular classes. A member of the group did a good job designing it and I got to help build it.” - 8th grader at Langdon Area High School*
- ⇒ *“The project was good because it made us work together as a team. I also liked it because they provided the group with input that helped us persevere through problems.” - junior at Langdon Area High School*

Mining for GEMS: Girls in Engineering, Math, and Science

By: Ashlen Wright, Program Founder and Sophomore at Sheyenne High School, West Fargo, North Dakota



When I told my friends that I wanted to be an engineer or a neuroscientist, shock and confusion flashed across their faces. “You want to do *what?*” one of my classmates asked. As a member of the American Mensa Society and a family of science and math professionals, I did not expect my interests would be considered unusual for a girl. As I confessed my curious professional choice, I realized it was going to take more than words to convince my peers otherwise.

Was something *wrong* with me? The anxiety of being alone in my career choice prompted some quick research about women in the work force and how we contribute to the world through our professions. I was surprised to learn only 27% of jobs in science, technology, engineering, and math (STEM) are held by women, but that these same women earn 33% more than women in all other fields. Since STEM plays such an important economic role, an increase in women pursuing these jobs will provide far-reaching benefits to society, especially with the growing number of women as heads of households. When women are empowered, society benefits exponentially because we reinvest 90% of our resources back into our families and communities. As such, I was inspired to create a program to encourage girls to become more interested in STEM. My hope is these girls will someday choose careers in STEM and pay it forward.

My plan consists of two parts. The first is to encourage girls in elementary and middle school to become excited about STEM. Through my own participation in Inventors Marketplace for Kids, four years of the U.S. Patent and Trademark Office’s Camp Invention, and then in serving as a camp counselor, I *know* girls get excited about science and math! Unfortunately, interest in STEM is diminished among girls of high school age.

In order to reach all of these age groups, the second part of my plan is to work directly with STEM directed organizations and companies which benefit from the skill set of employees in these fields. To leverage the synergy of such groups, I used the National Girls Collaborative Project (NGCP) as a resource. The NGCP brings together organizations throughout the United States in its mission to strengthen girl-serving STEM programs.

I have become a regionally known STEM advocate, founded and serve as Chair of the Red River Valley STEM Student Advisory Board and have reached **over 1,500 girls**. I am a keynote speaker at regional STEM events, a partner of North Dakota State University STEM Outreach and am working as Rasmussen College’s National Technology Dean. I will continue to serve as a camp counselor at STEM camps and in afterschool STEM programs. Engaging in this capacity is so rewarding because I have seen the “spark” and am changing the mindset of girls!

I am passionate about being a catalyst for progress in the national movement for girls in STEM, especially as it relates to the North Dakota Department of Public Instruction’s initiative. Let’s work together so that North Dakota colleges will have more young women pursue STEM majors. Someday those women will assume leadership roles and be a force for good in our communities. Together we can change the outdated stereotype that science, technology, engineering and math are only for boys.



Expansion of STEM AmeriCorps Announced at White House Science Fair

New partnerships with the New York Academy of Sciences, the STEM Funders Network, and the Afterschool Alliance will advance initiative President Obama launched in 2013.

WASHINGTON, D.C. – As part of today’s White House Science Fair, the Corporation for National and Community Service (CNCS), the federal agency that administers AmeriCorps, announced major expansions of STEM AmeriCorps that will support STEM mentoring opportunities for young people. This \$2.5 million expansion includes two new programs that are the result of new partnerships with the New York Academy of Sciences, as well as the Afterschool Alliance and the STEM Funders Network.

Through a partnership with the New York Academy of Sciences, CNCS will place more than 10 AmeriCorps VISTA members in afterschool STEM mentoring programs in 60 of the poorest neighborhoods in New York City and Newark, N.J. The AmeriCorps VISTA members will recruit, train, and place scientists as mentors in high-poverty schools and community based organizations to demonstrate the opportunities in STEM-related fields for students. This three-year program will benefit 2,600 school-aged children in 130 classrooms with 260 scientist mentors.

“AmeriCorps members are improving the lives of millions of citizens and having a positive and lasting impact on the toughest challenges facing our communities,” said Wendy Spencer, CEO of the Corporation for National and Community Service. “By strengthening STEM education for students, especially those from low income backgrounds, STEM AmeriCorps will spark greater interest in math and science and build ladders of opportunity these students might otherwise never have. The new partnerships with the New York Academy of Sciences, the Afterschool Alliance, and the STEM Funders Network are another step forward in achieving this mission.”

“If you look at some of the world’s greatest challenges – hunger and obesity, Alzheimer’s disease and our aging population, energy and water shortages – you’ll find New York Academy of Sciences Members at the forefront of the search for innovative solutions. It comes as no surprise that our Members want to be a part of solving the STEM education crisis,” said Ellis Rubinstein, President and CEO, The New York Academy of Sciences. “Over 1000 Academy Members have already volunteered to teach and mentor kids through the Afterschool STEM Mentoring Program. This generous grant from CNCS will build our capacity to bring this experience to thousands more, and help inspire the next generation of STEM innovators.”

STEM Ecosystems, an initiative supported by a new partnership between CNCS, the Afterschool Alliance, and the STEM Funders Network, will place up to 28 AmeriCorps VISTA members in as many as 14 communities across the nation to create and connect STEM-rich learning environments, equip educators, support youth pathways, and cultivate cross-sector partnerships. Built on more than a decade of research of successful collaborations, the STEM Ecosystems Initiative seeks to nurture and scale effective STEM learning opportunities for all young people. These collaborations happen inside and outside the classroom—in afterschool and summer programs, at home, in science centers, libraries and other places both virtual and physical.

“Over the past year, the STEM Funders Network has supported the cultivation and design of STEM Learning Ecosystems across the country, ensuring that STEM learning is truly ‘everywhere’ and is a top priority for communities supporting youth to develop the skills and knowledge they will need to be successful and competitive in our changing global workforce landscape,” said Gerald Solomon, Executive Director of the Samueli Foundation and Co-Chair of the

Expansion of STEM AmeriCorps Announced at White House Science Fair (continued)

STEM Funders Network. “Partnering with the Corporation for National and Community Service and the Afterschool Alliance to help bring AmeriCorps VISTA members to the initiative is critical to further cultivation of STEM Learning Ecosystems, impacting thousands of children and youth through integrated STEM learning settings.”

“Afterschool programs, with their emphasis on engaged, hands-on learning, are a dynamic and effective setting for innovative STEM education,” said Afterschool Alliance Executive Director Jodi Grant. “We’re delighted to be able to partner with the Corporation for National and Community Service and the STEM Funders Network to expand STEM learning opportunities and strengthen afterschool’s role as partners in the STEM learning ecosystem. Adding AmeriCorps VISTAs and STEM education opportunities to communities in need will better position young people to thrive in the global workforce of tomorrow. Giving young people more STEM learning opportunities benefits all of us.”

First announced by [President Obama at the White House Science Fair in 2013](#), STEM AmeriCorps is a multi-year effort that has placed hundreds of AmeriCorps members in nonprofits across the country, mobilizing STEM professionals to inspire young people. Current STEM AmeriCorps initiatives include partnerships with FIRST, Maker Education Initiative, Citizen Schools, US2020, Teach for America, Best Buy, and other organizations – efforts collectively engaging tens of thousands of students in STEM learning.

The Obama Administration has made STEM education a major priority. In 2009, the President launched “Educate to Innovate,” a nationwide effort to ensure all students have the tools to be innovators and problem solvers, and in this year’s State of the Union address, the President called on education, business, and nonprofit leaders to help give every child the opportunity to learn computer science.

Today’s announcements build on recent commitments from CNCS that underscore the President’s belief that the Nation’s students have the potential to help make our country, and our world, a better place. In January, CNCS announced [Computer Science Teachers AmeriCorps](#), a partnership with the National Science Foundation, as part of the Administration’s [Computer Science for All](#) initiative. The \$35 million commitment from CNCS will support the training of teachers in computer science to meet the current level of interest by students who seek more advanced instruction in computer science skills, such as coding. As part of the Administration’s [ConnectALL](#) effort, CNCS also recently announced a new [partnership with Institute of Museum and Library Sciences](#) that will utilize AmeriCorps members to increase access to digital literacy tools in tribal and rural communities.

18th Annual North Dakota Technology Students Association State Conference

The 18th Annual North Dakota Technology Students Association (TSA) State Conference was held on March 21-22, 2016, at the Baymont Inn in Mandan. Approximately 240 students from 20 schools attended and competed in over 40 events, all of which are considered to be STEM. Events such as:

- | | | | |
|----------------------------|--------------------------|--------------------------|---------------------------|
| - Biotechnology Design | - Catapult Design | - CAD 3D Engineering | - Desktop Publishing |
| - Digital Video Production | - Dragster Design | - Engineering Design | - Electrical Applications |
| - Fashion Design | - Flight | - Medical Technology | - Music Production |
| - Problem Solving | - Structural Engineering | - Prepared Presentations | - Transportation Modeling |
| - VEX Robotics | - Video Game Design | - Vinyl Design | - Webmaster |

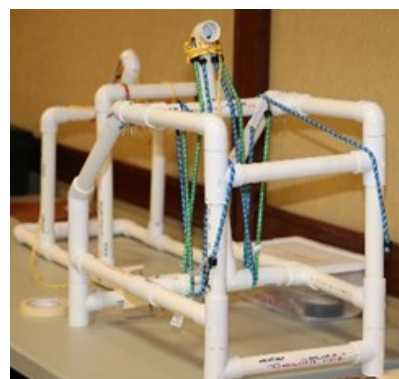
All of the events require the students to use the engineering design process. Some of the events are completed at school and brought to the conference, some are completed at the conference and others are a combination of the two. All events are judged by adult volunteers, who bring their professional and personal experiences to the conference in order to help the students grow in their knowledge of STEM. TSA fosters personal growth, leadership, and opportunities in science, technology, engineering, and mathematics (STEM).

TSA is a national organization of students engaged in STEM. Open to students enrolled in or who have completed technology and engineering education courses, TSA's membership includes over 233,000 middle and high school students in approximately 2,000 schools spanning 49 states. North Dakota currently has 408 members in 29 chapters. TSA chapters take the study of STEM beyond the classroom and give students the chance to pursue academic challenges among friends with similar goals and interests. Chapters have three main goals: competition, leadership skills, and service.



Competition is mainly accomplished by preparing for and competing in the State Conference in the STEM events listed above. Many students have to compete with other members of their chapter in order to be able to compete at the State Conference as the number of entrants is limited. First, second, and third place winners are eligible to compete at the National Conference in June. This year's conference is in Nashville, Tennessee.

Leadership is accomplished by holding chapter meetings, electing officers, giving presentations, and a variety of other activities. North Dakota has state officers elected at the State Conference. The candidates give speeches and participate in an Open Forum. Any member can ask questions and the candidates answer to the best of their ability. Occasionally, a North Dakota state officer chooses to run for national officer. This was the case just last year. Logan Volk, West Fargo, ran for national vice-president. Even though he did not win, he tells everyone it was a great experience and he grew personally from the experience.



Service can be accomplished in a variety of ways. The American Cancer Society's Relay for Life is a national partner with TSA. TSA encourages its chapters to do fundraisers for this important work throughout the year. Each year at the state conference, the state officers choose to do such a fundraiser.

Intentional integration of math and science into the technology and engineering projects is the goal of integrative STEM. This goal was evident to everyone who attended the TSA conference.

High School Anatomy Classes Invited to University of Mary to Work with Synthetic Cadavers

By: Jodi Roller, Dean of the School of Health Sciences, University of Mary

University of Mary School of Health Sciences invites high school anatomy classes to come to our campus during the 2016-2017 academic year and experience an anatomy lesson they won't soon forget. University of Mary School of Health Sciences, through a grant provided by the Margaret A. Cargill foundation, has developed a synthetic cadaver laboratory for its health science and anatomy students. An experienced anatomy teacher will be on hand to give a full body anatomy lesson to high school anatomy students. With six Syndavers, we will be able to easily handle up to 24 students. If you would like your students to take part in this opportunity, which is free except for transportation, please contact [Jodi Roller](#), Dean of the School of Health Sciences, to get more details and set up a time for next fall or spring.



Syndavers are made of synthetic human tissues and body parts. The six models purchased include all of the major skeletal, joints, muscular, and cartilaginous structures and organs present in typical human anatomy. Major vascular and nervous system components are also included. They are full sized head-to-toe models.

Visit [Syndavers](#) for more information.

For Immediate Release

April 21, 2016

NDASSP State Academic Olympic Competition

Phone: 701-642-2604

Email: [Ned Clooten](#), NDASSP President

On Monday, April 18, 2016, 18 high schools competed against each other to be crowned State Academic Champions. The North Dakota Association of Secondary School Principals is very proud to have its first three Academic State Champions. In the Class B Small School division, McClusky defeated Wyndmere and Medina in the lightning round to be crowned State Champions. In the Class B Large School division, Park River defeated Hazen and Kindred for the win. In the Class A division, Bismarck High edged out Dickinson High and Fargo Davies to take home the crown. Visit [NDASSP State Academic Olympic Competition](#) for pictures of all the teams, team point totals, and more.

Competition Teams:

- Class B Small – Bowbells, McClusky, Dakota Prairie, Center-Stanton, Medina, and Wyndmere
- Class B Large – Glenburn, Rugby, Park River, Hazen, Ellendale, and Kindred
- Class A – Fargo Davies, Fargo South, Wahpeton, Bismarck Century, Bismarck High, and Dickinson



Class A Champions
Bismarck High School



Class B Large School Champions
Park River High School



Class B Small School Champions
McClusky High School



UNIVERSITY OF MARY
America's Leadership University

Scholarship Opportunity

School of Arts and Sciences
Department of Biology

Greetings from the U Mary Biology Faculty!

We want to make you aware of an exciting opportunity available to low-income seniors who are interested in a career in the areas of wildlife/conservation biology or environmental science. The Biology Department recently received a generous S-STEM grant from the National Science Foundation to fund our ECOWEB Program (Expanding Career Opportunities in Wildlife and Environmental Biology). This program provides both academic and financial support to students, as well as provides them unique opportunities to build relationships with scientists and employers in the areas of wildlife/conservation and environmental biology.

Some specific highlights of the ECOWEB program include that it:

- Provides **scholarships of \$8,000-10,000/year** for four years to students with financial need majoring in wildlife/conservation biology or biology with a minor in environmental science at U Mary.
- Broadens student experience by providing opportunities to be involved in research and internships, participate in citizen science projects, visit a graduate school and attend a professional conference.
- Supports student success through one-on-one faculty and peer mentoring. Program advisors are experts in wildlife/conservation biology and ecology/environmental science.
- Connects students with wildlife conservation and environmental science professionals to build professional relationships, allow students to explore career options, and expand their knowledge.

To qualify for an ECOWEB scholarship, a candidate must be a U.S. citizen, national, legal permanent resident or refugee alien, be a full-time student with a declared biology major with either a wildlife conservation biology concentration or environmental science minor, demonstrate financial need based on the FAFSA, have a minimum high school GPA of 3.0* and math ACT score of 25*, submit 2 letters of recommendation, one of which must be from a high school science or math teacher, and participate in an interview with the Selection Committee. (*Although these are optimal criteria, the Selection Committee will consider candidates scoring below these thresholds if the candidates demonstrate strengths in other areas of consideration.)

For more information, or to apply, students can visit our website at ecoweb.umary.edu, or contact any of us at the email address or phone number listed below. We'd be happy to visit with you and/or interested students!

If you have any students you think would benefit from this scholarship program, we'd really appreciate you making them aware of this opportunity. Thank you in advance for your help, and please don't hesitate to contact us if you have any questions!

Sincerely,

Margaret A. Nordlie, DA
ECOWEB PI
mnordlie@umary.edu
701-355-8148

Michael T. Lares, PhD
ECOWEB Co-PI and
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701-355-8380

Upcoming 2016 State and National Conferences

Register Now

July 12-15, 2016



NATIONAL
MATH + SCIENCE
INITIATIVE

LAYING THE FOUNDATION

Magic City Campus High School
Minot, ND



NORTH DAKOTA DEPARTMENT OF
PUBLIC INSTRUCTION

Sponsored by the
Division of Student Support & Innovation

Two credits offered

<http://training.nms.org/Portal/Registration/RegistrationMap.aspx>

SAVE THE DATE!



UNITED TRIBES
TECHNICAL COLLEGE

2016
JULY 25-29

PRAIRIE ROSE PROJECT
SUMMER YOUTH CAMP

UTTC CAMPUS | BISMARCK, ND

UTTC
STREAM
SCIENCE
TECHNOLOGY
RECREATION
ENGINEERING
ART
MATHEMATICS

The Prairie Rose Project Summer Youth Camp is for Native American students living on reservations who will be entering the 9th grade.

There is no cost to attend camp.* Campers will be provided all meals and will lodge in secured dorms located on UTTC campus.

Campers will engage in various activities that focus on the STREAM curriculum areas (Science, Recreation, Technology, Engineering, Art, & Math) and are taught by professional educators.

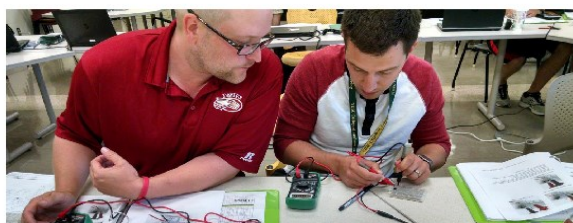
Openings are limited, so register early!

To request more information contact:
Jennifer Held, Administrative Assistant
Phone: 701-221-1428 | Email: jheld@uttc.edu

*Funded by the Prairie Rose Project, an Office of Indian Education, U.S. Department of Education, Demonstration Grant

PROJECT LEAD THE WAY CORE TRAINING

North Dakota State University
July 25 to August 5, 2016



Please join us for Launch, Gateway and Engineering core training. Master teachers will lead interactive, hands-on training focused on implementing best teaching practices and using new equipment.

Participants also will have the opportunity to learn about cutting-edge research from faculty members in NDSU's College of Engineering and see what industry partners offer Project Lead the Way engineering classrooms.



NDSU COLLEGE OF
ENGINEERING

SUMMER 2016 CORE TRAINING AT NDSU

LAUNCH 3-day session: August 1-3

Cost: \$896.00 (includes meal plan, parking, and tuition.)

GATEWAY 5-day session:

• Automation and Robotics August 1-5

Cost: \$1320.00 (includes meal plan, parking, and tuition.)

Computer Science 5-day session: August 1-5

• Introduction to Computer Science

Cost: \$1320.00 (includes meal plan, parking, and tuition.)

ENGINEERING 10-day sessions: July 25-August 5

Courses available:

• Civil Engineering and Architecture

• Principles of Engineering

Cost: \$2675.00 (includes meal plan, parking, and tuition.)

CREDIT

Professional credit is available for all sessions.

REGISTER

Registration for core training is scheduled to open mid-March. Visit pltw.org and select "Register Now."

Prerequisite: Readiness training

ACCOMMODATIONS

Hotel accommodations are available at Candlewood Suites near the NDSU Campus and Fargo airport. More information will be provided upon registration.

For additional information, contact:

• Affiliate director: Holly Erickson at hollyerickson@ndsu.edu or 701-231-7697

• Project Lead the Way: schoolsupport@pltw.org or 877-335-7589



Science in Motion; Using Movement to Teach the Solar System

WHERE: Bismarck State Heritage Center, Bismarck, ND

WHEN: June 22—23, 2016

TIME: 8:30 am—5:00 pm

REGISTRATION LINK: http://educators.und.edu/workshop/?id=TL_S1MUM2THSS

Course Description:

Why does the moon disappear? What does it feel like to jump on Jupiter? How old would you be if you were born on Mercury?

Join us to answer these questions and more as we explore how to make your classroom a fun and moving place for both you and your students! This workshop will provide 3rd–5th grade teachers with tools and techniques for implementing a 5-lesson unit on the Solar System, all through movement. Our bodies will become planets, moons, and stars as we put the solar system literally into motion! Participants will be introduced to the basic concepts for using movement in the classroom and incorporate these concepts into lessons on the solar system, the earth's movement, gravity, and moon phases. Next, participants will learn to guide students through the process of creating a culminating performance for their school community, family, and friends. Be prepared to move, laugh, reflect, and connect meaningfully with other teachers as we explore the power of kinetic learning!



NORTH DAKOTA COUNCIL ON THE ARTS

LET'S CO-CREATE

The complex challenges that business and social enterprise work to address require the ability to collaborate in spaces where there are no clearly prescribed roles, outcomes or solutions. At Mobius, we call this capacity co-creation.

The practices embedded in the Mobius Method cultivate the essential ability within ourselves to co-create. We help you strengthen your co-creation muscles.



*"Can we learn science like this everyday?"
4th grader, after her first Mobius class*

WHAT IS MOBIUS?

Mobius Method is a movement-based approach to creating a shortcut to learning, connection and trust. When we collectively engage our minds, bodies and emotional intelligence, it creates a very different kind of environment in which to learn. The Method includes a K-12 curriculum that teaches science standards through movement, making STEM concepts accessible to a diverse range of young learners.

CREATIVITY/ACADEMICS

Mobius uses creative movement to help children explore science concepts. Each class includes some exercises that have no right or wrong answer and is simply a creative exercise; for example, how does a solid, liquid or a gas move across the room? Mobius classes also include content that *does* have a right or wrong answer and creates the mental model for students to understand *why* an answer is right or wrong; for example, students moving together to demonstrate the relative density of molecules in solid, liquid and gas states.

MOVING TO LEARN

Mobius lessons give children opportunities to collaborate together, to lead and to follow others. It gets kids moving their bodies, offsetting the reduction in recess and PE in many schools. Mobius is a holistic approach to teaching a subject that is often reduced to the most traditional teaching methods and therefore opens science to a more diverse group of learners.

MOVE YOUR MIND: AMELIA TERRAPIN AT TEDXJACKSONHOLE

<https://youtu.be/ACbmMm7St54>



Amelia is an experienced dancer, systems thinker, and educator based in Asheville, North Carolina. Reluctant to choose between art and science, her work unites the two.

She founded Mobius to use movement as a powerful transformative tool for groups that range from schoolchildren and at-risk teens to engineers and business executives. Through movement, participants gain a deep understanding of complex ideas, build trust, and discover new ways to collaborate effectively. Amelia is especially passionate about 3rd–5th graders and the teachers who inspire them.

www.mobiusmethod.com



*Mobius unleashes our bodies' intelligence,
transforming challenges into opportunities...*



Resources

Storyjumper

STEAMed Quarterly Digital Magazine - Excited about STEAM and want to learn more about this innovative approach to education? Welcome to the STEAMed magazine! This quarterly publication is absolutely FREE to you, thanks to the generous partners in each edition.

North Dakota STEM

Scratch

NDDPI Now on Twitter!

@NDDPI: North Dakota Department of Public Instruction

@NDDSSI: Division of Student Support & Innovation

STEM Twitter Sites

@NSTA: National Science Teachers Association.

@TeachingSTEM: A networking and information service for science, technology, engineering and mathematics teachers and educators in schools and colleges.

@CADREK12: CADRE supports STEM education researchers and developers funded by the National Science Foundation.

@SciAfterSchool: Dedicated to improving afterschool STEM learning for all youth.

Grant Opportunities

Toshiba

Grades 6-12. Next grant cycle: October 1, 2016

Honda

Grant cycle deadlines: February 1, May 1, August 1, and November 1

Unsung Heroes Scholarship America

The Captain Planet Foundation

Grant deadlines: September 30 and January 31.

Sol Hirsch Education Fund Grants

Application for the 2016-2017 school year opened February 2016

The Verizon Foundation

This grant is by invitation only. Contact your Verizon Relations Manager in your area to learn more about this opportunity. (Site has a search engine to find your local Verizon Relations Manager)

Digital Wish Grants

Login to Digital Wish and submit a technology-based lesson plan for a chance to win over 50 different technology grants. Grants will be awarded on the 15th of every calendar month.

Call for Educators & Students: We Want to Hear from You!

Educators

We want to hear from educators in the field. If you are doing something innovative and exciting in the area of STEM/STEAM, please contact us. While North Dakota is a state in which there is usually one degree of separation, I know for a fact that there are innovative, exciting things happening in classrooms, libraries, and before and after school in the areas of STEM/STEAM that other educators are unaware of. This newsletter is a forum for educators to share what they are doing. Please consider contacting us about what you are doing. We would love to share it in our newsletter.

Students

Do you have a student who has excelled in the areas of STEAM? If so, please consider sharing this student and their accomplishments. The STEAM Newsletter will be featuring *Student Reflections* as a regular feature.

Please contact:

[Beth Larson-Steckler](#)

Office: (701) 328-3544

Fax: (701) 328-0203

MSP Reminders

- **Quarterly Report**

The lead agency is responsible for preparing and submitting the quarterly report. To access the template, click [quarterly report template](#). The quarterly report is due to the NDDPI on the following dates:

⇒ **June 27, 2016**

⇒ **September 26, 2016**

⇒ **December 2016**

⇒ **March 2017**

- **Annual Progress Reports**

The lead agency is responsible for completing and submitting the annual progress report each year. To access the template, click [annual progress report template](#). The annual progress report is due to the NDDPI by October 30, 2016.

Contact Information

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